REMARKS

Claims 14-46 are presently pending in this Application and the Examiner rejected claims 14-46 under 35 U.S.C. 103 over U.S. Patent No. 6,757,255 to Aoki et al. for Apparatus For And Method Of Measuring Communication Performance, hereafter referred to as Aoki et al. `255, in view of U.S. Patent No. 6,363,429 to Ketcham for a Method and System For Automatic Determination Of Priority Data Streams On Computer Networks, hereafter referred to as "Ketcham `429".

The Applicant thanks the Examiner for the extensive analysis of Aoki et al. `255 at pages 2 through 16 of the Official Action, and the analysis of Ketcham `429 at pages 17 through 20, but wishes to point out that the relevance of a prior art reference is not in whether similar words and phrases can be found in the references and in the claims, but in how the apparatus or method of the reference is actually structured and operates in comparison to the claimed invention. That is, the teachings and suggestions of a reference must be considered as a whole and in the context of the reference, and not in individual words and fragmentary phrases extracted from their context.

For the following reasons, therefore, the Applicant respectfully disagrees with the Examiner's interpretation of Aoki et al. `255 and Ketcham `429, and respectfully traverses the stated rejections over the cited prior art.

First considering the teachings and suggestions of Aoki et al. `255, this reference describes a method for measuring the performance of specific TCP and UDP data transfers on an individual basis by using actual data or measurement oriented packets to determine the performance of each specific data transfer in terms of bandwidth by measuring such factors as trip time (RTT), maximum segment size (MSS), average congestion window size (ACWS), packet discard rate (PDR) and packet discard event rate (PDER).

It is therefore apparent that there are a number of fundamental distinctions between the present invention and the teachings and suggestions of Aoki et al. `255. For example, Aoki et al. `255 tries only to measure the performance of a specific data transfer rather than the performance of a network connection or path, as in the present invention. The basic nature of this distinction can be realized when it is understood that there can be many data transfers occurring over a given connection or path and that the performance of each data transfer will most probably differ from preceding and following data transfers because of changes in the connection or path, such as changes

In the volume of data being carried by the connection or path. In further illustration, and particularly in packet based systems, a given data transfer, being comprised of a sequence of packets, may actually take place over a number of paths or connections. Both the specific paths or connections and the performance of the individual paths or connections can and probably will change from packet to packet, or at least from data transfer to data transfer, even between the same origin and the same destination.

As a result, the Aoki et al. `255 system, since it measures the performance only of specific, individual data transfers, can represent the path performance only for a specific, individual data transfer and cannot and does not provide a representation of the path or connection itself and over time.

The basic distinction between Aoki et al. `255 and the present invention results in a still further fundamental distinction between Aoki et al. `255 and the present invention. That is, the method and system of the present invention measures the network conditions in order to improve the performance of the communications link or path by determining, for example, the optimum packet size and transmission rate for all data transfers through the communications link or path. In contrast, Aoki et al. `255 does not operate to improve the performance of the communications link or path as a whole, but instead attempts to do no more than to improve the transmission of a specific, individual data transfer.

In a further distinction between the present invention, the method and system of the present invention determines the network conditions through the use solely of measurement-oriented packets, and does not employ data packets for these purposes. For example, the packet discards and discard events referred to in the present Application apply only to data transfer packets and not to measurement oriented packets.

In addition, it must be noted that the method and system of the present invention derives a number of variables from the measurement-oriented packets in order to use these variables to optimize, for example, packet size and transmission rate in optimizing general data transfers over a communications path. For example, the variables derived by the method and system of the present invention may include average delay, maximum delay, minimum delay, average jitter, maximum jitter, minimum jitter, flow, packet loss ratio out of order ratio and trend.

In fundamental contrast form the present invention, however, the Aoki et al. `255 system is primarily concerned only with deriving round trip time from the packets, and employs this variable primarily to calculate only a congestion window size in order to determine the maximum packet size that can be transmitted in a given data transfer under current congestion conditions. As a result, the Aoki et al. `255 not only determines a different communications path variable than does the system of the present invention, but also determines a different system conditions factor from that variable, that is, congestion window size and maximum packet size for the congestion window rather than optimum packet size and transmission rate. In addition, and as discussed above, the Aoki et al. `255 system determines a congestion window size and maximum packet size for that congestion window only to improve performance of a single data transfer rather than improving the performance of the communications path itself over a number of data transfers.

In a further fundamental distinction between Aoki et al. `255 and the present invention, it must be noted that Aoki et al. `255 explicitly uses packet measurement for the sole purpose of determining the maximum segment size (MSS) for a given single data transmission, and describes this maximum segment size (MSS) as being the current maximum transmission unit (MTU) for the communications path between the sender and the receiver for that transmission.

In contrast to Aoki et al. `255, the method and system of the present invention does not determine a maximum transmission unit (MTU) or maximum segment size (MSS) for a communications path, and does not do so for only a single data transmission over that communications path. Instead, the method and system of the present invention determines the optimum packet size for a number of data transfers over a communications path wherein the optimum packet size is, according to the present invention, the largest packet size that can be transmitted through the communications path without being fragmented or rejected, thereby maximizing the overall data throughput of the communications path.

It will therefore be appreciated by those of ordinary skill in the arts that the optimum packet size for a communications path as determined by the present invention is a very different entity than the maximum segment size determined by Aoki et al. `255, which merely determines the largest packet that can be forced through the communications path at that instant in time. In fact it is very possible that use of the

maximum segment size in a data transfer as taught by Aoki et al. `255 will result in the fragmentation or rejection of some or all of the packets and a consequent slowing of the data transfer rate, which is the exact opposite of the result provided by the present invention.

It is therefore the belief and position of the Applicant that, for the above discussed reasons, Aoki et al. `255 does not teach or suggest the present invention under the requirements and provisions of 35 U.S.C. 103.

Next considering Ketcham `429, this reference is directed at improving quality of service and providing priorities for data traffic on a communications path by calculating a "signature" for the data traffic received from the communications path wherein the signature is calculated as a function of average received packet size, spacing and jitter and variations in packet size, spacing and jitter.

It will therefore be apparent that there are a number of fundamental distinctions between the present invention and Ketcham `429. For example, the method and system of the present invention does not prioritize data transfers on a communications path, but instead determines the optimum packet size and transmission time to optimize the data throughput rate of the communications link.

If further fundamental distinction, the method and system of the present invention employs measurement-oriented packets to determine various variables of the system to thereby determine the optimum packet size and transmission rate of the communications link. In complete contrast from the present invention, however, the Ketcham `429 system does not employ measurement-oriented packets at all but instead operates solely with any data packets received from the communications link. As such, the Ketcham `429 system is inherently incapable of determining at least some of the variables determined by the present invention because many critical factors of the data packets, such as size, rate of transmission, and so on are effectively unknown as regards the determination of these variables.

For example, and in further distinction in this regard, in the Ketcham `429 system the data traffic signature is created using an average packet size, spacing and jitter and variations in packet sizes of whatever data packets are received by the receiver. Most of these variables are therefore dependent upon the characteristics of the original packets transmitted from the sender to the receiver rather than reflecting the conditions of the communications link itself.

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In complete contrast from Ketcham `429, the system and method of the present invention employs specifically constructed and transmitted measurement-oriented packets transmitted at recorded times and rates to measure average delay, maximum delay, minimum delay, average jitter, maximum jitter, minimum jitter, flow, packet loss ratio, out of order ratio and trends in these variables. It will first be noted that these variables pertain to the conditions of the communications link itself, and not to the characteristics of the original packet in themselves, as in Ketcham `429. It must also be noted that in further complete contrast from Ketcham `429, these variables can be determined only by the use of specifically constructed and transmitted measurement-oriented packets and cannot be determined merely from whatever data packets happen to be received, as in Ketcham `429.

In related matters, and in further fundamental distinction between the present invention and Ketcham `429, the Ketcham `429 determines characteristics, that is, signatures, of the existing data packets to determine priorities in the communications path to improve the transmission of the existing data packets. As a consequence, the Ketcham `429 is not concerned with communications path conditions at all, but only with the characteristics of the data packets as received In addition, the Ketcham `429 system employs the signature information only to determine priorities in the communications path, and does not even attempt to or consider modification of the data packet or the transmission of the data packets to improve data transmission through the communications path.

In contrast, the system and method of the present invention operates to determine conditions of the communications path, rather than the characteristics of the data packets, and modifies the data packets, that is, the packet size and transmission times, to optimize data throughput of the communications path. The system and method of the present invention therefore employs an entirely different approach and method to perform an entire different set of operations than Ketcham `429, and to achieve an entire different result than Ketcham `429.

It is therefore the belief and position of the Applicant that, for the above discussed reasons, Ketcham `429 does not teach or suggest the present invention under the requirements and provisions of 35 U.S.C. 103.

Next considering the combination of Aoki et a . `255 in view of Ketcham `429, and first considering whether the combination of Aoki et al. `255 in view of Ketcham

`429 is a permissible combination which and would occur to one of skill in the arts, it will be apparent from the above discussions that there are very significant fundamental differences between Aoki et al. `255 and Ketcham `429 that would mitigate against any combining of the two references as suggested by the Examiner.

For example, Aoki et al. `255 attempts only to optimize the execution of a single data transfer while Ketcham `429 attempts to improve the execution of a number of current data transfers.

A further distinction between Aoki et al. `255 and Ketcham `429 is that Aoki et al. `255 attempts to determine the maximum size segment, or packet, that can pass through the communications link without being fragmented or rejected. In contrast, Ketcham `429 attempts to determine the signatures of data transfers in order to prioritize the transfers and thereby improve performance of the data transfers.

In a still further distinction, Aoki et al. `255 examines only the data packets of a single, specific data transmission, that is, the data packets of the data transfer it is attempting to optimize, while Ketcham `429 examines the data packets of a variety of data transmissions, and more specifically, any data packets that happen to arrive during the examination period.

It is clear, therefore, that Aoki et al. `255 and Ketcham `429 examine entirely different data to extract entirely different information upon which to base entirely different acts that are intended to achieve entire different goals by entire different means. As such, it is clear that it would not occur to one of ordinary skill in the arts to combine the teachings of Aoki et al. `255 and Ketcham `429 in any way because the teachings of Aoki et al. `255 and Ketcham `429 are so fundamentally different from one another in every respect. It is further clear that for the same reasons Aoki et al. `255 and Ketcham `429 are not a valid or proper combination and should be withdrawn at this time.

Notwithstanding the above, the following will next consider whether any combination of Aoki et al. `255 and Ketcham `429 could lead to any teaching or suggestion pertinent to the present invention. It must be explicitly understood, however, that the following discussions of such a combination are solely for the purposes of discussion and do not form any explicit or implicit any admission or concession on the validity or permissibility of any combination of Aoki et al. `255 and Ketcham `429.

It is also be clear from the above discussions, however, that there is no combination of Aoki et al. `255 and Ketcham `429 that could in any way result in any teaching or suggestion pertinent to the present invention.

For example, Aoki et al. `255 attempts only to optimize the execution of a single data transfer while the present invention attempts to optimize the execution of a number of data transfers.

The present invention modifies the data packets themselves, that is, the packet size and transmission rate, to optimize the passage of the data packets through the communications link while Aoki et al. `255 attempts to find only the maximum size packet that can be crammed through the communications network and Ketcham `429 does not effect the data packets themselves but instead functions only to prioritize the data transfers.

The present invention determines the variable used in determining the optimum packet size and transmission rate primarily by examining measurement-oriented packets specifically constructed for the measurement process. In complete contrast, Aoki et al. `255 analyzes both data and measurement packets, but only for a single transmission, and Ketcham `429 analyzes any data packets that happen to arrive during the measurement period.

In a further fundamental distinction arising from the above distinction, the variables measured by the present invention reflect conditions in the communications link rather than the characteristics of the data packets. Aoki et al. `255 and Ketcham `429, however, determines characteristics of the data packets themselves, that is, their performance in transmission versus packet size or transfer prioritization, so that the variables measured by Aoki et al. `255 and Ketcham `429 reflect the characteristics of the packets rather than attempting to isolate the conditions in the communications link itself.

It is therefore apparent that not only are Aoki et al. `255 and Ketcham `429 so different from one another that the teachings of Aoki et al. `255 and Ketcham `429 cannot be validly or properly combined, but also that even if an attempt were made to combine selected aspects of Aoki et al. `255 and Ketcham `429, the resulting combination still would not teach or suggest the present invention under the requirements and provisions of 35 U.S.C. 103.

Upon review of the presently pending claims, the Applicant notes that independent claims 14 and 31 include recitations setting forth certain of the basic fundamental distinctions over the cited prior art that have been discussed herein above, specifically the determination of network conditions rather than packet characteristics, and the adjustment of the packets, that is, packet size and transmission intervals, to optimize data transmissions through the network. Independent claims 29, 30, 45, 46 and 47 include both these basic recitations and still further recitations of the basic aspects of the present invention that distinguish the present invention over the cited prior art.

It is therefore the belief and position of the Applicant that claims 14, 29, 30, 45, 46 and 47 are thereby fully distinguished over the teachings and suggestions of Aoki et al. `255 in view of Ketcham `429 under the requirements and provisions of 35 U.S.C. 103. The Applicant accordingly respectfully requests that the Examiner reconsider and withdraw all rejections of claims 14, 29, 30, 31, 45, 46 and 47 over Aoki et al. `255 in view of Ketcham `429, under the requirements and provisions of 35 U.S.C. 103, and allow claims 14, 29, 30, 31, 45, 46 and 47.

In addition, each of the remaining claims is a dependent claim and is directly or indirectly dependent from one of independent claims 14, 29, 30, 31, 45, 46 and 47 and therefore include the distinguishing recitations and limitations of claims 14, 29, 30, 31, 45, 46 and 47 by dependency. It is therefore the belief and position of the Applicant that all of the dependent claims are thereby fully distinguished over the teachings and suggestions of Aoki et al. `255 in view of Ketcham `429 under the requirements and provisions of 35 U.S.C. 103. The Applicant accordingly respectfully requests that the Examiner reconsider and withdraw all rejections of the dependent claims over Aoki et al. `255 in view of Ketcham `429, under the requirements and provisions of 35 U.S.C. 103, and allow dependent claims 15-28 and 32-44.

Lastly, the Examiner cited additional prior art references as of interest, but not in rejection of any of the claims under either 35 U.S.C. 102 or 35 U.S.C. 103 and the Applicant concurs with the Examiner's conclusion that these additional references do not, taken individually or in any combination, teach, suggest or disclose the present invention under the requirements and provisions of either 35 U.S.C. 102 or 35 U.S.C. 103.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejection(s) should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the Aoki et al. `255 and Ketcham `429 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,

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